Executive Summary

The maritime mobile frequency band supports maritime communications worldwide. Appendix 18 of the ITU Radio Regulations (RR) defines the channels of the maritime mobile service. These channels support a variety of communication functions including: public correspondence, intership and ship-to-coast, coast- to-ship, port operations, calling and various safety purposes. Safety functions include distress, search and rescue, ship movement, navigation (bridge-to-bridge) communications, and maritime safety information broadcasts. One type of service that can enhance these functions is called a Vessel Traffic Service (VTS). The VTS will enable ships and shore stations to automatically transmit and receive information between themselves in coastal and port areas and inland waterways. Ships will also be able to automatically exchange information on the high seas. The ships and shore stations will be able to exchange data on ship size, speed, location, heading, cargo and other pertinent information, such as navigation hazards and pollution spills.

The Coast Guard plans to operate an Automatic Independent Surveillance (AIS) digital selective calling (DSC) based transponder system as part of the Ports and Waterways Safety System (PAWWS) in the lower Mississippi River. The service area for this Vessel Traffic Service (VTS) system ranges from a 20 mile radius around the sea buoy located at the mouth of the Southwest Pass entrance of the Mississippi River, to river mile 255 above Baton Rogue.

In a VTS area served by a shore side monitor, the system requires at least one dedicated duplex marine VHF channel for digital data transmissions. One frequency of the duplex pair is used for transponder-to-base station communications and is known as the A side of the channel. The other frequency of the duplex pair is used for base station-to-transponder communications and is known as the B side of the channel. Large VTS areas such as the lower Mississippi River will require additional duplex channels for signal coverage and some type of frequency re-use plan. In areas not served by a VTS shore based monitor, a simplex channel is used for ship-to-ship operations. A report published by NTIA which has been coordinated with the maritime community, NTIA TR-343 "*Assessment of Compatibility Between 25 and 12.5 kHz Channelized Marine VHF Radios*" concluded that a VTS like system could operate on interstitial channels as long as it was assigned frequencies in coordinated areas, such as duplex channels allocated to public correspondence services. However, additional studies performed by NTIA for the Coast Guard and Radio Technical Commission for Maritime Services (RTCM) Special Committee (SC)-117 have shown that the maritime mobile VHF band in the New Orleans is shared with numerous land mobile transmitters and NOAA VHF weather broadcasts. These transmitters are known to cause interference in some VHF marine radios and may also interfere with AIS operations.

Therefore, to ensure that the VTS AIS system operates with a minimal amount of RF interference on its VHF data links, the Coast Guard requested that NTIA survey the duplex public correspondence channels and the interstitial channels between them for interference and evaluate their potential to be used as AIS data channels. In addition, the interstitial channels on the edge of the public correspondence channels were monitored for interference. Personnel from NTIA and the Institute of Telecommunication Sciences (ITS) performed shipboard tests August 10-14, 1998 and shore based tests September 5-9, 1998 to complete these tasks.

The evaluation of the channels potential for use as AIS data channels was based on SINAD histographs and SINAD maps that were produced based on data collected during the tests. The histographs and SINAD maps of the interstitial channels show that they have potential for use as AIS data channels. However, additional tests should be conducted with crystal filters installed at each shore station which will provide the base stations receiver

additional protection from adjacent channel radio operations.

NTIA recommends that the Coast Guard develop a strategy for planning and coordinating, the use of the interstitial and public correspondence channels for AIS operations, with the auction winners in each district that the Coast Guard intends to operate a VTS system. Furthermore, channels that are identified as possible VTS channels should be dedicated to AIS operations and not be shared with any other types of services or functions so that the VTS system can operate with a minimal amount of RF interference to enhance its safety and reliability.